

REMARKS

By this amendment, claims 1-25 have been amended. Thus, claims 1-25 are now active in the application. Reexamination and reconsideration of the application are respectfully requested.

Initially, Applicants and their undersigned attorney wish to thank Examiner Binda for the courteous and helpful telephone interview granted on November 9, 2009.

In the interview, the merits of independent claim 1 were discussed with respect to the prior art rejection presented in item 3 on pages 2-4 of the Office Action based upon the Sadatomo (JP 2-113123) reference and the Rose (US 2,343,244) patent. The arguments presented in the interview are repeated below. In the interview, the Examiner indicated that, upon filing a written response, the prior art rejection presented in the last Office Action would most likely be withdrawn.

It is noted that the Rose patent applied in the Office Action has not been officially cited of record and, accordingly, it is respectfully requested that the Rose patent (US 2,343,244) be officially cited on a Form PTO-892.

Preliminarily, it is noted that the formatting of the claims has been revised to provide line indentations between claim elements, in order to obviate the objection presented in item 1 on page 2 of the Office Action. A grammatical correction has been made in claim 11 by adding the word "wherein". The claims have not, however, been substantively amended.

Thus, turning to the merits of the application, in items 3-9 on pages 2-8 of the Office Action, claims 1, 3, 4, 10, 13, 14 and 21 were rejected under 35 U.S.C. 103(a) as being unpatentable over Sadatomo (JP 2-113123) in view of Rose (US 2,343,244); claims 2, 11 and 15 were rejected under 35 U.S.C. 103(a) as being unpatentable over Sadatomo and Rose and further in view of Tajima et al. (US 2002/0068639); claims 5-9 were rejected under 35 U.S.C. 103(a) as being unpatentable over Sadatomo and Rose and further in view of Bilz et al. (US 6,497,622); claims 12 and 16 were rejected under 35 U.S.C. 103(a) as being unpatentable over Sadatomo and Rose and further in view of Hirota et al. (US 2003/0106758); claim 25 was rejected under 35 U.S.C. 103(a) as being unpatentable over Sadatomo and Rose in view of Hirota and Tajima; claim 17 was rejected under 35 U.S.C. 103(a) as being unpatentable over Sadatomo and Rose and further in view of Frost (US 6,609,454); and claims 18-20 and 22-24 were rejected under 35 U.S.C. 103(a) as being unpatentable over Sadatomo and Rose and further in view of Honda et al.

(US 6,370,772). These rejections are respectfully traversed, and it is respectfully requested that the rejections be withdrawn, for the following reasons.

With exemplary reference to the present drawing figures, independent claim 1 (from which all of claims 2-25 depend) sets forth a shaft coupling comprising: two axially opposed rotary members 1, 2 having rotation axes that can be positioned so as to be parallel to and not aligned with each other, the rotary members 1, 2 having axially opposed surfaces axially facing each other (see the facing surfaces of the rotary members 1, 2 in Fig. 1b), each of the axially opposed surfaces being formed with a plurality of guide grooves 5, 6 each axially facing and extending perpendicular to one of the guide grooves 6, 5 formed in the other of the axially opposed surfaces; rolling elements 3 each disposed between a pair of axially facing guide grooves 5, 6 at a portion where the pair of axially facing guide grooves 5, 6 cross each other so as to roll while being guided by the pair of axially facing guide grooves 5, 6; and a retainer 4 for restricting movements of the rolling elements 3 in a radial direction of the rotary members 1, 2, whereby power is transmitted between the rotary members 1, 2 through the rolling elements 3; wherein the retainer 4 has elongated holes 7 formed therein, each of the elongated holes 7 extending perpendicular to a diametric direction at a location corresponding to the portion where the respective pair of axially facing guide grooves 5, 6 cross each other; and wherein the rolling elements 3 are respectively rollably disposed in the elongated holes 7.

Thus, according to claim 1, not only do the axially facing rotary members 1, 2 have guide grooves 5,6 formed therein that are perpendicular to one another, but a retainer 4, for retaining the rolling elements 3, is provided to transmit power between the rotary members 1, 2, and the retainer 4 has elongated holes 7 formed therein with the rotary members 3 disposed in such elongated holes 7. The elongated holes 7 of the retainer 4 are required by claim 1 to each extend perpendicular to a diametric direction at a location corresponding to the portion where the respective pair of axially facing guide grooves 5, 6 cross each other, as illustrated in Fig. 1a. In other words, rolling elements 3 are disposed in the mutually perpendicular guide grooves 5, 6 of the rotary members 1, 2, and are also disposed in the elongated holes 7 of the retainer 4, and these elongated holes 7 are oriented so as to extend perpendicular to a diametric direction at a location corresponding to the portion at which the respective pair of axially facing guide grooves 5, 6 cross each other. Due to these features of the present invention, wherein the rotary members 1, 2 have their axes offset, as shown for example in Fig. 3b, the rolling elements 3 revolve,

altering each position within each elongated hole 7 in the retainer 4 along with the change of the crossing points of the guide grooves 5,6 in the circumferential direction. Therefore, the rotating center of the retainer 4 is not altered when the axes of the rotary members 1, 2 are offset, and the retainer 4 only rotates, thereby avoiding unnecessary vibrations.

In contrast, the Sadatomo reference discloses axially opposed rotary members 2, 4 having guide grooves 7a-7d and 9a-9d that are respectively perpendicular to each other, as well as a retainer 10, but the retainer 10 merely has holes formed therein for receiving rolling elements 12a-12d. There is no disclosure or suggestion in Sadatomo of the use of elongated holes, as required by claim 1. As such, the Sadatomo configuration suffers from the vibrations caused by altering of the position of the retainer upon offsetting of the axes of the rotary members 2, 4.

The Examiner cited the Rose patent for teaching “a retainer (18, 19) having elongated holes (25) formed therein, each of said elongated holes extending perpendicular to a diametric direction at a location, and wherein several rolling elements (27) are respectively rollably disposed in said elongated holes.”

However: (1) the elongated holes (25) of Rose are not perpendicular to a diametric direction at a location corresponding to the portion where the respective pair of axially facing guide grooves cross each other, as required by claim 1. In this regard, compare the grooves 7 illustrated in present Fig. 1a that are perpendicular to a diametric direction in the location corresponding to the portion where the respective pair of axially facing guide grooves face each other, with the grooves 25 in Figs. 3 and 4 of Rose; and (2) the Rose disks 18, 19 are fixed for rotation (see bolt 22 and nut 24) with the rotary member 12, 13 of Rose and, therefore, do not correspond to a retainer, such as the retainer 10 disclosed in Sadatomo. As such, clearly a person having ordinary skill in the art would not have found it obvious to modify the Sadatomo retainer 10 to include elongated holes, simply in view of the elongated holes formed in the fixed disks 18,19 of Rose. Even if a person having ordinary skill in the art would have made such modification, such modification would not have resulted in the present invention of claim 1, since the elongated holes (25) of the Rose fixed disks 18, 19 are not perpendicular to a diametric direction at a location corresponding to the portion where the respective pair of axially facing guide grooves cross each other, as required by claim 1.

Therefore, for the reasons presented above, and as discussed in detail in the telephone interview, it is respectfully submitted that a person of ordinary skill in the art would not have found the present invention of claim 1 obvious in view of the Sadatomo and Rose references.

The Tajima, Bilz, Hirota, Frost and Honda references were cited by the Examiner for teaching various other features of the invention as recited in the dependent claims. These tertiary references provide no teaching or suggestion that would have obviated the above-discussed shortcomings of the Sadatomo and Rose references. Therefore, it is respectfully submitted that claim 1, as well as claim 2-25 which depend therefrom, are clearly allowable over the prior art of record.

In view of the foregoing amendments and remarks, it is respectfully submitted that the present application is clearly in condition for allowance. An early notice thereof is earnestly solicited.

If, after reviewing this Amendment, the Examiner feels there are any issues remaining which must be resolved before the application can be passed to issue, it is respectfully requested that the Examiner contact the undersigned by telephone in order to resolve such issues.

Respectfully submitted,

Takashi NOZAKI et al.

/Charles R Watts/

By 2009.11.19 14:38:25 -05'00'

Charles R. Watts

Registration No. 33,142

Attorney for Applicants

CRW/cbc
Washington, D.C. 20005-1503
Telephone (202) 721-8200
Facsimile (202) 721-8250
November 19, 2009